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a. Bakersfield to Sylmar (Tehachapi/ Antelope Valley)

Wilderness areas in and adjacent to this section of the alignment include Sierra and Angeles National Forests, as well as Magic Mountain and Pacifico Potential Wilderness areas. Concerns through this section include impacts to linkages, roadless areas, potential wilderness areas, wetlands, and threatened and endangered species. For wide-ranging species such as black bear, mountain lion, deer, and bobcat, habitat fragmentation and death due to train strikes is a major concern in this section. In the Santa Clara River area of the proposed alignment, the Southern California Evolutionary Significant Unit for steelhead is intersected and thus impacted.

Wildlife movement corridors impacted:

- CV 2: The South End San Joaquin Valley corridor is a landscape linkage for the San Joaquin kit fox, blunt-nosed leopard lizard, short-nosed kangaroo rat, and LeConte's thrasher. The alignment crosses this corridor at the SR-58 corridor and I-5 Tehachapi corridor subsections.
- SN 10: The Southern Sierra Checkerboard corridor is a landscape linkage for deer, bear, mountain lion, and bobcat. The alignment crosses this corridor along the SR-58 corridor subsection in two locations.
- DE 12: The San Gabriels/Tehachapi corridor is a missing linkage for movement of desert wildlife in general. The alignment crosses this corridor along the SR-58 corridor subsection.
- SC 113: The Soledad Canyon/ Mint Canyon corridor is a choke-point for the movement of large mammals, three-spine stickleback, southwest willow flycatcher, and western spadefoot toad. The alignment crosses this corridor at the Soledad Canyon corridor subsection in three locations.
- SC 111: The Highway 5/Newhall Pass corridor is a landscape linkage and choke-point for the movment of mammals in general. The alignament crosses this corridor at the I-5 Tehachapi corridor and Soledad Canyon Corridor subsections.

b. Bakersfield to Sylmar (I-5 route) route:

Wilderness areas in or adjacent to this section of alignment include Los Padres and Angeles National Forests, and Sespe Wilderness. Potential wilderness areas include Antimony, Redrock Mountain, Salt Creek, San Francisquito, Magic Mountain, and Tule. Other undeveloped areas in the vicinity include Wind Wolves Preserve (owned by Wildlands Conservancy) and Tejon Ranch. Major concerns in this section are impacts to linkages and habitat fragmentation. Wide-ranging animals may be affected by fragmentation of habitat and train strikes.

Wildlife movement corridors impacted:

- CV 2: The South End San Joaquin Valley corridor is a landscape linkage for the San Joaquin kit fox, blunt-nosed leopard lizard, short-nosed kangaroo rat, and LeConte's thrasher. The alignment crosses thos corridor at the SR-58 corridor and I-5 Tehachapi corridor subsections.
- SN 17: The Southern Sierra corridor is a choke-point for the movement of deer, bear, and mountain lion.
- SC 12: The Castaic Highway 5 corridor undercrossing addresses a choke-point for mammals. The alignment crosses this corridor at the I-5 Tehachapi corridor subsection.
- SC 60: The Santa Clara River corridor is a landscape linkage for fish and birds. The alignment crosses this corridor at the I-5 Tehachapi corridor subsection.
- SC 111: The Highway 5/Newhall Pass corridor is a landscape linkage and choke-point for the movement of mammals in general. The alignment crosses this corridor at the I-5 Tehachapi corridor and Soledad Canyon Corridor subsections.

c. Sylmar to LA Route:

Wildlife movement corridors impacted:

- SC 115: The Griffith Park/Verdugo Hills corridor is a missing linkage for large mammals. The alignment crosses this corridor at the Metrolink/UPRR: Burbank Downtown Si and I-5: Glendale subsections.

4. LA to San Diego Route:

Major concerns through this section of the state include impacts to linkages, threatened and endangered species, vernal pools, and coastal streams and lagoons. Roadless or wilderness areas include Penasquitos Canyon and Carmel Mountain Preserve. Public or protected lands include state beaches (Doheny, San Clemente, San Onofre) and San Diego National Wildlife Refuge. Within the UC Riverside area, there may be a loss of local open space and impacts to species such as Stephens' kangaroo rat and Santa Ana sucker. Extensive consultation with CDFG and FWS would likely be necessary for impacts through this area. In southern Orange County, creek crossings along this alignment could result in impacts to steelhead migration. Construction could affect vernal pools on Camp Pendelton. Within the Inland San Diego County section, there are extensive vernal pool complexes adjacent to I-15 and SR-52 corridors that could be impacted by construction.

Within the coastal San Diego County section the alignments have a high potential to impact all coastal lagoons in the area. In addition, it is important to maintain connectivity between these coastal lagoons and inland open space for predators. Rare southern maritime chaparral communities (e.g., Del Mar manzanita and wart-stemmed ceanothus) are found on sandstone bluffs in this area are could be impacted by the proposed project.

a. LA Union Station to March ARB Alignment

Critical habitat impacted:

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- San Bernardino Kangaroo Rat critical habitat will be most impacted by Subsegment 1C1.
- California gnatcatcher critical habitat will be impacted by Segment 1B1 > 1A1.

Wildlife migration corridors impacted:
- SC 201: The San Gabriel River corridor is a missing linkage for the river channel. The alignment crosses this corridor at the UP/Colton 1 and UP/Riverside line subsections.
- SC 203: The Puente/San Jose/San Gabriel corridor is a missing linkage and choke-point for large carnivores, raptors, songbirds, and other furbearers. The alignment crosses this corridor at the UP/Colton 1 and UP/Riverside line subsections.
- SC 206: The Lytle Creek Drainage corridor is a landscape linkage and choke-point for the river channel. The crosses the corridor at the UP/Colton line to San Bernardino subsection.
- SC 207: The Santa Ana River corridor is a landscape linkage for the Santa Ana sucker, least Bell's vireo, southwest willow flycatcher, and San Bernardino kangaroo rat. The alignment crosses this corridor at the UP/Colton 3 and UP/Colton line to San Bernardino subsections.

b. March ARB to Mira Mesa Alignment:

Critical habitat impacted:
The alignment will impact critical habitat for the following species: Arroyo toad, California gnatcatcher, Quino checkerspot butterfly, Southwestern willow flycatcher, and vernal pool species. These impacts must be analyzed.

Wildlife migration corridors impacted:
- SC 225: The San Jacinto River corridor is a landscape linkage for coyote and rare plants. The alignment crosses this corridor at the San Jacinto to I-5 subsection.
- SC 230: The Tucalota Creek corridor is a choke-point for the movement of coastal California gnatcatcher and Los Angeles pocket mouse. The alignment crosses this corridor at the San Jacinto to I-5 subsection.
- SC 228: The Pechanga Corridor is a landscape linkage for mountain lion, deer, and bobcat. The alignment crosses this corridor at the San Jacinto to I-5 subsection.
- SC 4: The San Luis Rey corridor is a choke-point for the movement of large carnivores, deer, and steelhead. The alignment crosses this corridor at the San Jacinto to I-5 subsection.
- SC 3: The San Diequito River corridor is a choke-point and main corridor for large carnivores and deer. The alignment crosses this corridor at the San Jacinto to I-5 subsection.
- SC 1: The Penasquitos Canyon and Carmel Mountain Preserve corridor is a choke-point for the movement of large carnivores and deer. The alignment crosses this corridor at the San Jacinto to I-5 subsection.

c. Mira Mesa to San Diego Alignment:

Critical habitat impacted:
- Riverside fairy shrimp critical habitat will be impacted by the Mira Mesa to Qualcomm stadium alignment.

Wildlife migration corridors impacted:

Miramar Road to San Diego
- SC 2: The San Diego River corridor is a choke-point for the movement of large carnivores, deer, and steelhead. The alignment crosses this corridor at the SR-52 to Santa Fe Depot subsection.

Anaheim to Irvine
- SC 220: The El Toro Linkage corridor is a missing linkage for coyote. The alignment crosses this corridor at the Fullerton to Irvine subsection.

Irvine to Oceanside
- SC 222: The Oso Creek corridor is a choke-point for bobcat, coyote, and songbirds. The alignment crosses this corridor at the San Juan Cap Trench and San Juan Cap I-5 subsections.

Oceanside to San Diego
- SC 3: The Diequito River corridor is a choke-point and main corridor for the movement of large carnivores and deer. The alignment crosses this corridor at the Encinitas to Solana Beach subsection.
- SC 1: The Penasquitos Canyon and Carmel Mountain Preserve corridor is a choke-point for the movement of large carnivores and deer. The alignment crosses this corridor at the I-5/I-805 split to SR-52 and Miramar Hill Tunnel subsections.
- SC 2: The San Diego River corridor is a choke-point for the movement of large carnivores, deer, and steelhead. The alignment crosses this corridor at the SR-52 to Santa Fe Depot subsection.

II. Adequacy of mitigation measures

A. The DEIR/EIS fails to adequately discuss the adequacy of overpasses and underpasses to facilitate species movement.

Yanes et al. (1995) studied vertebrate movement through 17 culverts under roads and railroads in Central Spain. The results of this study indicate that animal movement was dependent on culvert dimensions, road width, height of boundary fence, the complexity of the vegetation along the route, and the presence of detritus pits at the entrance of culverts. The construction of underpasses and overpasses is a nascent effort. The

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DEIR/EIS contains only a fleeting discussion of this issue without any citation to scientific literature. This section needs significant expansion and detailed discussion of the issues involved in the siting and construction of overpasses and underpasses.

The following are some additional underpass/overpass issues that should be incorporated in the mitigation discussion:

- To reduce collision, fences should be checked, repaired, and built high enough, and vegetation should be kept down so that wildlife is not attracted to the railway.
- Wildlife crossings should be installed at a frequency of one every 1-3 km in areas where there are large animals, regardless of how many large animals are observed, and one every 5-10 km where there are no large animals but the habitat is favorable for them. Because these animals follow traditional routes, success depends greatly on the location of the passage. The crossing should be built on the exact site of the interrupted path if it is to be really effective. The restoration level should be as near as possible to the natural ground level; however, connecting gradients does not make the structure ineffective.
- Underpasses are effective only if they are large enough and properly landscaped.
- Planting trees along the lines, the tops of which would be at least the same level as the top of the pylons, can reduce the risk of collision for some bird species.
- For amphibians, some of the compacted ballast under the rails should be removed, and prefabricated corridors should be installed under the rails. For tortoises, netting should be buried 10 cm deep alongside a rail to direct them to a passageway.
- Vegetation in edge zones that is attractive to ungulates should be removed. Elimination of vegetation from railway verges makes it easier to see animals alongside the railway and limits their presence by not attracting them.
- Reflective mirrors, repellents, ultrasound, and road lighting are not effective in reducing collisions.

<u>See</u> COST – European Co-operation in the Field of Scientific and Technical Research. 2000. Habitat fragmentation due to transportation infrastructure. COST 341, French state of the art report

1. San Joaquin Kit Fox:

Underpasses are the preferred crossing structure for SJKF and should be at least 0.5m high and 0.5m wide. Also, in order to maintain normal daily movement patterns, underpasses should be placed every 0.5km. Exclusionary fences should be used to encourage foxes to use the crossing structures (Bjurlin 2003). Fencing should be buried in the ground deep enough that coyotes, foxes, and other digging animals cannot dig under them and enter the tracks. Artificial dens and dens to escape predators should also be incorporated alongside the tracks in San Joaquin kit fox habitat.

B. Numerous reasonable mitigation measures were not even discussed in the DEIR/EIS.

The DEIR/EIS discussion of mitigation was so cursory that it failed to include the following potential mitigation strategies:

ii. Speed of operation
iii. The preference to construct rail lines along existing roads only
iv. The installation of wildlife warning devices
v. Reduced train speed in wildlife areas or during times in which wildlife are active (e.g., May for bears).
vi. Carcass removal to decrease attraction for carnivores and scavengers.
vii. Clean up of any spilled grain or food attractants.
viii. Reduce vegetation that is attractive to wildlife
ix. Minimizing fragmentation and/or maximizing the ration of areas of fragments.
x. Narrowing travel corridors.
xi. Insulation of catenary suspension wire.
xii. Oversizing of insulators to discourage perching by birds.

These are just a few of the mitigation options that should be discussed in the DEIR/EIS.

Again, biological impacts of the high speed train will vary considerably based on alignment. Yet, the DEIR/S does not provide the information necessary to evaluate these differences. The analyses suggested above, which are techinically feasible, must be performed in advance of alignment decisions.

Literature Cited

Andrews, A. 1990. Fragmentation of habitat by roads and utility corridors: a review. Australian Zoologist. 26(3&4):130-141.

Beier, P. 1995. Dispersal of juvenile cougars in fragmented habitat. Journal of Wildlife Management 59:228-237.

Bhattacharya, M., R.B. Primack, and J. Gerwein. 2003. Are roads and railroads barriers to bumblebee movement in a temperate suburban conservation area? Biological Conservation 109:37-45.

Bjurlin, C.D. 2003. Effects of roads on San Joaquin kit foxes: a review and synthesis of existing data. Abstract from the 2003 Proceedings of the International Conference on Ecology and Transportation. www.itre.ncsu.edu/cte/icoet

Bowles, A.E. 1997. Responses of wildlife to noise. *In* Wildlife and recreationists: coexistence through management and research, edited by R.L. Knight and K.F. Gutzwiller, 109-56. Washington, D.C.: Island Press.

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Buechner, H.K. 1950. Life history, ecology and range use of the pronghorn antelope in Trans-Pecos Texas. American Midland Naturalist 43:257-355.

COST – European Co-operation in the Field of Scientific and Technical Research. 2000. Habitat fragmentation due to transportation infrastructure. COST 341, French state of the art report. ftp://ftp.cordis.lu/pub/cost-transport/docs/341-08-f-en.pdf

DeSanto, R.S. and D.G. Smith. 1993. Environmental auditing: an introduction to issues of habitat fragmentation relative to transportation corridors with special reference to high-speed rail (HSR). Environmental Management 17:111-114.

Evink, G.L. 2002. Interaction between roadways and wildlife ecology: a synthesis of highway practice. National Cooperative Highway Research Program Synthesis 305. Transportation Research Board, The National Academies, Washington, D.C.

Evink, G.L. 1990. Wildlife Crossings of Florida I-75 *In* Transportation Research Record 1279, National Research Council, Washington, D.C., pp. 54-59.

Fay, R.R. 1988. Hearing in vertebrates: a psychophysics databook. Winnetka, Illinois: Hill-Fay Associates.

Forman, R.T.T. and L.E. Alexander. 1998. Annual Review of Ecological Systems 29:207-31.

Forman, R.T.T., and R.D. Deblinger. 2000. The ecological road-effect zone of a Massachusetts (USA) suburban highway. Conservation Biology 14:36-46.

Forman, R.R.T., D. Sperling, J.A. Bissonette, A.P. Clevenger, C.D. Cutshall, V.H. Dale, L. Fahrig, R. France, C.R. Goldman, K. Heanue, J.A. Jones, F. J. Swanson, T. Turrentine, and T.C. Winter. 2003. Road Ecology: science and solutions. Island Press, Washington, D.C. 481 pp.

Gelbard, J.L., and S. Harrison. 2003. Roadless habitats as refuges for native grasslands: interactions with soil, aspect, and grazing. Ecological Applications 13(2): 404-415.

Girard, I. 2001. Field cost of acticity in the kit fox, *Vulpes macrotis*. Physiological and Biochemical Zoology 74(2):191-202.

Kreithen, M.L. and D.B. Quine. 1979. Infrasound detection by the homing pigeon: A behavioral audiogram. Journal of Comparative Physiology (series A) 129:1-4

Leeson, B. 1996. Hishway conflicts and resolutions in Banff National Park, Alberta. Trends in addressing transportation related wildlife mortality *In* Proceedings of the transportation related wildlife mortality seminar, FL-ER-58-96, Florida Department of Transportation, Tallahassee, pp. 91-96.

National Wildlife Federation. *Paving Paradise: Sprawl's Impact on Wildlife and Wild Places in California*. San Diego, Calif.: National Wildlife Federation, 2001.

Natural Resource Defense Council. 1999. End of the road: the adverse ecological impacts of roads and logging: a compilation of independently reviewed research. http://www.nrdc.org/land/forests/roads/eotrinx.asp

O'Gara, B.W., and J.D. Yoakdum, eds. 1992. Pronghorn management guides. Proceedings of the Pronghorn Antelope Workshop 15 (supplement).

Rodriguez, A., G. Crema, and M. Delibes. 1997. Factors affecting crossing of red foxes and wildcats through non- wildlife passages across a high-speed railway. Ecography 20(3):287-294.

Shen, J.X. 1983. A behavioral study of vibrational sensitivity in the pigeon (*Columba livia*). Journal of Comparative Physiology 152:251-55.

Trombulak, S.C. and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14(1):18-30.

White, R.W. 1969. Antelope winter kill, Arizona style. Proceedings of the Western Association of Game and Fish Agencies 49:251-254.

White, P.A. and M. Ernst. 2003. Second nature: improving transportation without putting nature second. Defenders of Wildlife and Surface Transportation Project report, 70 pp.

Yanes, M., J.M. Velasco and F. Suarez. 1995. *Permeability of roads and railways to vertebrates: the importance of culverts*. Biological Conservation. 71: 217-222.

Van der Grift, E.A. 2001. The Impacts of Railroads on Wildlife. Bibliography Notes from the Road RIPorter, Volume 6.6 (http://www.wildlandscpr.org/databases/biblionotes/biblio6.6.html)

Van Riper, C., III, and R.A. Ockenfels. 1998. The influence of transportation corridors on the movement of pronghorn antelope over a fragmented landscape in northern Arizona. Pp. 241-248 *In* Proceedings of the 2nd International Conference on Transportation and Wildlife Ecology. D. Zeigler, ed. Fort Meyers, Florida.

Van Riper, C., III, J. Hart, J. Bright. 2001. Effects of fenced transportation corridors on pronghorn antelope movement. *In* Petrified Forest National Park, Arizona. Crossing Boundaries in Park Management: Proceedings of the 11th Conference onResearch and Resource Management in Parks and on Public Lands. D. Harmon (ed.), Michigan: The George Wright Society.

Yanes, M., J.M. Velasco and F. Suarez. 1995. Permeability of roads and railways to

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vertebrates: the importance of culverts. Biological Conservation. 71: 217-222.

Attachment D

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August 31, 2004
S&A #041013

TO: Eddy Moore
Senior Project Manager
Planning and Conservation League Foundation
926 J Street, Suite 612
Sacramento, California 95814

SUBJECT: Engineering Geology Review of "Draft Program Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Proposed California High-Speed Train System" prepared by the California High-Speed Rail Authority and the Federal Railroad Administration

This office has reviewed the Geology and Soils section of the Draft EIR/EIS (Section 3.13) as well as the Hydrology and Water Resources section (Section 3.14), and any of the attached figures, as well as the reference list for these items (Sections 12.15-12.16). Additionally, this office also reviewed the following document titled "Bay Area to Merced, Geology & Soils Technical Evaluation" prepared by Parsons and Geotechnical Consultants, Inc, dated January 2004:

Based on the review of these documents, knowledge of the overall geology, and having been in projects that involved tunneling, preliminary investigations, actual grading experience, groundwater (both regional and local) and bedrock fracturing, faulting and joints, the following comments are provided for your consideration. While the Draft EIR/EIS is done on a preliminary basis, or overview, the items below need to be addressed "prior to the selection of high speed rail alignments" because, depending on alignment selection, they will have differing impacts on the environment, as well as on the design, construction, and cost of the proposed railway.

- Nowhere in the Draft EIR/EIS does it discuss the environmental impacts that would occur as a result of the geological and geotechnical preliminary investigations that would be needed to further refine any of the proposed routes through the Pacheco Pass, Northern Tunnel, Under Park Tunnel, and Minimize Tunnel. The proposed routes through the Diablo Ranges are in wilderness areas or in steep and remote areas with very limited access. In order to properly understand the complex geology that occurs in these areas, extensive subsurface exploration will be needed. Without a proper understanding of the subsurface

conditions there is a very high potential for life safety and construction hazards to occur during construction, as well as not allowing for the proper engineering due to lack of data. The hazards could include caving, weak and highly faulted areas that could be quite wide, as well as high local groundwater caused by the offsets of fracturing, faulting and secondary permeability and porosity which will be higher than the primary permeability and porosity. There could also be gases and other hazards. In order to verify these subsurface conditions, there would be an extensive array of borings, especially in the wide faulted areas. The need for this subsurface exploration would mean that there would need to be access roads cut in these steep, remote inaccessible locations, and deep borings with side cast materials piled in the area of the borings. There should also be geophysical lines run across these areas to further verify the unknown and very complex geologic conditions.

It should be understood that in order to perform the necessary subsurface explorations, access roads will need to be cut by track-mounted bulldozers along the proposed routes so that boring equipment of varying sizes can have access to the route to perform the subsurface exploration. The only other option would be to helicopter in any of the drilling rigs, but this can be a very costly, hazardous endeavor. In either case, drill rigs would still be adversely impacting the environment where the drilling takes place.

- The Los Angeles subway project encountered many unexpected problems due to a lack of proper subsurface investigation data. The work done by the Independent Technical Review Committee for the Los Angeles Metro Rail Project documented many of these problems. The Independent Technical Review Committee was established and appointed by Congressman Henry Waxman and Congresswoman Bobbi Fiedler to study the Metro Rail Project and report its findings in 1984. The study was finalized by the Committee under the chairmanship of George W. Housner, Professor Emeritus, Caltech. The Committee was very critical of the work completed by the consultants for Metro Rail. Dr. James E. Slosson was a member of the Congressional Committee that penned the document. One of the many problems was the effect on local groundwater and dewatering of the tunnels.

- It is unclear why the Altamont Pass route has not been considered further from a geological and geotechnical viewpoint. This route has existing roads, pipelines and other features. The fact that there are roads, pipelines and other structures would indicate that a certain knowledge of the surface and surface geology of the area is available. Additionally, there are existing access roads for any equipment needed to perform the subsurface exploration. This would greatly minimize the environmental impact to the area as compared to the investigations into the steep, rugged, non-accessible areas of the other proposed routes, including the Henry Coe State Park. The Altamont Pass route, per Appendix 2-H-3 of the report, indicates that it has the same "maximize Avoidance of Areas with geologic and

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Soils Constraints" as do the Pacheco Pass and the Panoche Pass routes (a rating of 3 for all of the routes). It is unclear if the rating of 3 should be given to all routes when there is no data. It is possible that the Altamont route might have a better rating geologically and the other routes may have a poorer rating when all the data is collected.

- Currently, there is not enough data to correctly establish what the environmental impact may be on the local groundwater of the proposed routes. On Page 3.14-5, under the heading of Groundwater, it states "Shallow groundwater is subject to potential impacts from dewatering during construction." Based on past experiences of this office, and other tunneling projects, there can be a very noticeable and negative impact on the local groundwater, springs, seeps and quality of water. Based on the fault zones or faulted areas that the routes will be crossing or going through, there is a definite potential for impacts on the groundwater. The faults can act as groundwater barriers with water higher on one side of the fault as compared to the other. The fractures and joints, or higher secondary porosity and permeability of the bedrock, will allow water to move quickly through these broken and sheared materials. Without water and groundwater data collected during field and subsurface exploration (as discussed above) there is no way to correctly and adequately understand the local groundwater and what adverse environmental impact any tunneling will have on the local groundwater. It is possible that the drawdown of water during or as a result of construction will have a long-term effect on the local groundwater levels, springs, seeps and water quality, which has not been addressed. There have been recorded adverse effects caused by dewatering as well as changes of seepage forces.

- The DEIR/S does not discuss potential environmental impacts related to disposal of any groundwater which is encountered during any proposed tunneling. There will be a need to dewater portions of the excavations to maintain safety for the workers, as well as post construction to maintain safety of the tunnels. There needs to be consideration of the potential for localized and currently unknown adverse seepage forces affecting the tunnel walls. While the exact amount and location of the groundwater is unknown, as indicated above, the dewatering will have some impact on the environment. The water from the dewatering may well have sediment and a different water quality than the surface waters. Any mixing of these waters will impact the environment. This impact needs to be discussed.

- The Draft EIR/EIS indicates that the proposed routes through the Diablo Mountains will intersect two active faults. It should be understood that these "active faults" are typically a zone of faulting with many splays and subsplays of the main fault. These zones can be very wide and have a direct impact on the tunnel construction, slope and tunnel stability, and local groundwater. Additionally, the geologic maps for the area, from the State fault map and the

State geologic map, the Santa Cruz Sheet, Geologic Map of California, and the San Jose Sheet of the Geologic Map of California all show multiple faults which would intersect the proposed alignments or routes. The Draft EIR/EIS primarily only focuses on the active and potentially active faults. It does not include all of the "nonactive" faults the alignments cross. Will these faults have potential hazards of focusing energy from other earthquake faults, water, cracks, highly-sheared materials, etc. All of these faults need to be addressed as far as hazards in construction, post-construction, etc. Currently, they are not addressed in the Draft EIR/EIS. These multiple faults can have an impact on the construction of the alignments, be it tunneling, cuts at grade, fills, or other construction. Any impacts on the construction for the alignments will impact the environment somehow, especially if the conditions are unknown as discussed in the items above. If these faults are not considered and investigated there will be problems with the design and construction. Any problems with the design and construction will lead to time delays, cost overruns, hazards and impacts on the environment.

- It appears from the maps that the Hayward fault, the Silver Creek and the Calaveras fault all blend together in the area of the proposed alignments for Pacheco Pass, Northern Tunnel, Under Park Tunnel, and Minimize Tunnel options and, as such, the zone of faulting is probably quite wide in this area. Again, the Draft EIR/EIS is not complete in this regard as it indicates that the alignments cross only two active faults, the Calaveras fault and the Ortigalita fault. The extensive shearing will create adverse conditions that will impact the construction and the environment.

- Another item is the potential for explosive or hazardous gases in the area of the multiple fault zones. The multiple faults may very well have the potential for explosive and toxic gases along them. If this is not investigated completely it may well have a very adverse impact on life safety for construction as well as during the life of the project, which will have an adverse environmental impact. Again, this points to the need for extensive subsurface exploration and testing along the alignment routes. This exploration will have a very definite impact on the environment and has not been discussed.

- From a review of the State of California Seismic Hazard Mapping Program as conducted by the State Geologist's office, it does not appear that much of the area for the tunnel routes for Pacheco Pass, Northern Tunnel, Under Park Tunnel and Minimize Tunnel through the mountains is adequately mapped by the State. This does not mean that there are no seismic/geologic/hydrologic and possible existence of natural gases, only that the hazards have not been mapped and identified by the State. The firm of Slosson & Associates has been involved in studies of the Tehachapi earthquake and the damages incurred on the Tehachapi rail tunnel from the 1952 Kern County earthquake which severely damaged the tunnel and destroyed the track, the 1971 Sylmar tunnel explosion which was caused by

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Eddy Moore
Review of Draft EIR/EIS

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August 31 , 2004
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natural gas leaking into the tunnel excavation killing 17 workmen, the problems related to construction of the Sepulveda Metropolitan Water District Water Tunnel, and other construction difficulties related to construction of water tunnels. Based on a knowledge of the area, there are many seismic hazards in the region.

- Consideration should be given to utilizing the current edition of "Department of Transportation California Seismic Hazard map 1996 Based on Maximum Credible Earthquakes" Prepared by Caltrans Office of Earthquake Engineering and Design Support by Lalliana Mualchin, Engineering Seismologist. The most recent revised version of this map is shown to be Plot Modified July 2004. This map should be utilized for the magnitude and acceleration for each of the active and mapped faults and the impact it may have on the design and construction. Additionally, as indicated above, the other numerous faults that are not active and are not discussed in the Draft EIR/EIS will have definite impacts on the routes and will act as local controls for any seismic distress in the area from any earthquake. As was seen in the 1994 Northridge earthquake, other existing nonactive faults and active faults can focus energy along them leading to increased localized damage and distress within those fault zones.

These items need to be considered and addressed prior to approval of the Draft EIR/EIS as they will have a definite impact on the environment, construction and design of the proposed routes.

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Thomas L. Slosson
Supervising Engineering Geologist
R.G. #4204, C.E.G. #1327

JES:TLS:cg
Ref:ogzip.EIR/EIS

JAMES EDWARD SLOSSON

EDUCATION

1949	AB, Geology, University of Southern California
1950	MS, Geology, University of Southern California
1958	Ph.D., Geology, University of Southern California (Equivalency of minors in Geography, Engineering, Physical Science, and Social Science)
1957	Certificate of Completion, University of Illinois/National Science Foundation Grant
1959-1968	Post-Ph.D. studies, University of Southern California

PROFESSIONAL REGISTRATION

California	Registered Geologist No. 46 Certified Engineering Geologist No. 22 Registered Geophysicist No. 829 Registered Environmental Assessor No. REA-01849
Alaska	Registered Geologist No. 223
Arizona	Registered Geologist No. 8711
Arkansas	Registered Geologist No. 332
Delaware	Registered Geologist No. 134
Georgia	Registered Geologist No. 198
Idaho	Registered Geologist No. 104
North Carolina	Registered Geologist No. 332
Oregon	Registered Geologist No. G102
Oregon	Registered Engineering Geologist No. E102
Tennessee	Registered Geologist No. TN0633
Washington	Registered Engineering Geologist No. 971
Wyoming	Professional Geologist No. 733
Certified	Professional Hydrogeologist No. 933 American Institute of Hydrology

Chief Administrative Officer Credential, Community Colleges, State of California

Professor Emeritus, Los Angeles Valley Community College

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CIVIL SERVICE RATINGS ACHIEVED

1949	State Park Ranger, California
1949	Soil Scientist, U.S., GS-5
1950	Minerals Analyst, U.S., GS-7
1950	Oceanographer, U.S., GS-7
1951	Military Intelligence Research Specialist, GS-7
1952	Assistant Engineering Geologist, California
1956	Geologist, U.S.G.S., GS-9
1956	Geophysicist (Seismology) GS-9
1957	Geologist, Federal Power Commission, GS-9
1958	Associate Engineering Geologist, California
1958	Geologist, Fuels U.S.G.S., GS-11
1959	Geologist, Fuels U.S.G.S., GS-12
1966	Engineering Geologist, U.S.G.S., GS-14
1973	Deputy State Geologist, California
1973	State Geologist, California

PROFESSIONAL BACKGROUND AND EXPERIENCE

1975-present — Slosson and Associates
15500 Erwin Street, Suite 1123
Van Nuys, CA 91411
(818) 376-6540

Chief Engineering Geologist: Involved in engineering geology, seismic studies, forensic geology, groundwater, mineral resource search, energy resource investigation, data interpretation, geology/medicine, hazard mitigation and prevention, soil erosion abatement, legislative analysis and preparation.

1984-present — Professor Emeritus: Los Angeles Valley College

1975-1984 — Professor of Geology: Los Angeles Valley College

Chairman: Earth Science Department (1950-1965)

Rank of Full Professor of Geology (on leave for State service 1973-1975)

1974-1983 — Lecturer: University of Southern California, School of Public Administration, Environmental Management Institute

1974-present — Guest Lecturer: Many colleges and universities including University of California at Los Angeles, Berkeley, Davis, Riverside, Irvine; California Institute of Technology; California State University at Los Angeles, Northridge, Fullerton, Long Beach; Occidental College; University of Arizona; Portland State University; Texas A&M; University of Wisconsin; and others

1973-1975 — State Geologist/Chief of Division of Mines and Geology, State of California

1973 — Chief Deputy State Geologist, State of California

1970-1977 — Lecturer: Harvard University, Graduate School of Design, summer short courses in land-use and terrain analysis

1969 — Instructor: University of California at Los Angeles, Extension Division, visiting instructor

1964 — Assistant Professor of Geology: University of Southern California, Department of Geological Sciences, visiting instructor, summer program

1958-1973 — Consulting Geologist: Over 3,000 professional projects utilizing multi-disciplines within geologic technology

1957 — National Science Foundation Grant: University of Illinois, Program in Mineralogy and Geology, summer program

1952-1956 — Research Geologist: Gulf Oil Corporation (summers and 50% workload during academic year); research utilized for dissertation

1951, 1958 and 1959 (summers) — Engineering Geologist: Department of Water and Resources, State of California

1950-1973 — Professor of Geology: Los Angeles Valley College

1949-1950 — Geologist: United States Geological Survey (rating of GS-14 as of 1966), (W.A.E. for Master's Thesis)

1948-1949 — Laboratory Instructor: University of Southern California, Geology Department

1943-1945 — Second Lieutenant: United States Army, Athletic Instructor, Infantry Platoon Leader, and Aerial Observer

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PROFESSIONAL ORGANIZATIONS

American Association of Petroleum Geologists
American Geological Institute
American Geophysical Union (Recipient, silver award)
American Institute of Professional Geologists, Certificate #1109
American Society of Civil Engineers (Life Member)
Association of Engineering Geologists (Honorary Member)
Association of State Floodplain Managers
Earthquake Engineering Research Institute (Fellow)
Geological Society of America (Fellow)
National Association of Geology Teachers (Emeritus)
Seismological Society of America
Sigma Gamma Epsilon
Sigma Xi
Society of Economic Paleontologists and Mineralogists (Emeritus)
Structural Engineers Association of Southern California

PROFESSIONAL AWARDS

American Institute of Professional Geologists, John T. Gayley, Sr. Memorial Public Service Award, 1997

Geological Society of America, E.B. Burwell, Jr., Award for the Publication of *Forensic Engineering, 1996*

Geological Society of America, Roy Shlemon Applied Geology Mentor (Initial Awardee), 1996

Association of Engineering Geologists, Honorary Member Award, 1995

Geological Society of America Distinguished Practice Award, 1992

American Society of Civil Engineers, Life Member, 1991

Geological Society of America, Richard H. Jahns Distinguished Lecturer in Engineering Geology, 1989 University Lecture Series

Outstanding Educators of America Award, 1970

American Geophysical Union, Silver Award

PROFESSIONAL ACTIVITIES

Geologist	County of Modoc, 2000
Participant:	USGS Landslide Section, FY 1993-1994, Landslide Program Planning, Golden, Colorado
Subcontractor:	FEMA Disaster Response Team, 1992
Consultant:	Superior Court, County of Los Angeles, assigned to Judge Philip F. Jones, Advisor for Remedial Work, CRA Project, Monterey Hills, 1991-present
Commissioner:	California Seismic Safety Commission, representing engineering geology, appointed by Governor Pete Wilson, 1991-1999
City Geologist:	City of Moorpark, 1991-1996
City Geologist:	City of Calabasas, 1991-1993
City Geologist:	City of Corona, 1991-1993
Member:	National Academy of Sciences, Advisory Committee on Hazards and Municipal Liability, 1990
Chairman:	Superior Court, County of Los Angeles, assigned to Abalone Cove Landslide Abatement District, City of Rancho Palos Verdes, 1988-1994
Member:	Task Committee on Flood Hazard Analysis on Alluvial Fans, ASCE, 1989
Member:	National Research Council, Committee on Ground Failure Hazards, 1986- 1992
Guest Instructor:	Slope Stability and Landslides at 7th National Technical Course, College of Engineering, University of Wisconsin - Madison, 1987
Member:	Workshop on the "Use of Natural Hazards Research Results" at George Washington University, National Science Foundation, June 1 and 2, 1987
Technical Consultant:	Expert Witness, City Attorney's Office, City of San Diego, 1987-present

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James E. Slosson [6]

Chairman:	FEMA/Colorado Department of Public Safety Advisory Committee, Landslide Hazard Mitigation Project, 1986-1989
Member:	AAPG Ad Hoc Committee on Opportunities in Water Resources and Water Management, 1986-1988
City Geologist:	City of Monterey Park, 1986-1991
Session Chairman:	ASCE, Hydrology Annual Conference, "World Water Issues in Evolution" at Long Beach, 1986
Member:	Fairfax-Wilshire Task Force Committee, 1985 (Appointed by the Los Angeles City Council)
Member:	Independent Technical Review Committee for the Los Angeles Metro Rail Project -- Congressional Select Review Committee, 1985 (Appointed by Congressman Waxman and Congresswoman Fiedler)
Session Chairman:	University of Southern California Conference and Workshop on "Seismic Mitigation Management for Seaports," May 1985
Coordinator:	ASCE/OES Disaster Preparedness Committee; 1983-1987
Member:	California Radioactive Materials Management Forum, Public Education Committee, 1983
Member:	County of Los Angeles, Engineering Geology and Soils Review and Appeals Board, 1981-2000
City Geologist:	City of Agoura Hills, 1984-1998
Consultant:	American Indian Tribes (Council of Energy Resource Tribes), Mineral and Petroleum Resources, 1979-1985
Consultant:	California Public Utilities Commission for the proposed LNG facilities Pt. Conception California, 1978-1982
Consultant:	County of Ventura, County Engineer, 1978-present
Member:	City of Los Angeles, Earthquake Prediction Task Force, 1976-1983
Member:	State of California Earthquake Prediction Evaluation Council, 1975-1983
Technical Consultant:	Expert Witness, State of California, CalTrans, 1993-present

James E. Slosson [7]

Member:	City of Los Angeles, Hazardous Buildings Code Development Committee, Building and Safety Committee (URM/Seismic Safety), 1971-1973, 1976-1980
Member:	State of California Board of Registration for Geologists and Geophysicists, 1978-1985 (President 1978-1982)
Commissioner:	State of California Seismic Safety Commission, 1975-1978, 1991-1999
Member:	State of California Citizens Committee on U.S. Forest Service Management Practice for Roadless Areas, 1978-1979
Member:	American Society of Civil Engineers, Geotechnical Engineering Division, Rock Mechanics Committee, 1976-1980
Member:	Engineering Geology Advisory Committee, City of Los Angeles, Department of Building and Safety, 1975-1990
Member:	Advisory Committee for Socio-economic and Political Consequences of Earthquake Prediction, University of Colorado, National Science Foundation Study, 1975-1976
Member:	Oversight Committee on the Technology Assessment of Earthquake Prediction, Stanford Research Committee (FEMA), 1975-1976
Geologic Consultant:	State of California, Department of Transportation, 1993-present
Geologic Consultant:	County of Los Angeles, County Counsel, 1970, 1976-1996
Geologic Consultant:	State of California, Public Utilities Commission, 1976-1982
Geologic Consultant:	City of Thousand Oaks, Department of Public Works and Building and Safety, 1972-1973
Geologic Consultant:	Division of Forestry, State of California, 1975
Member:	Governor's Earthquake Council, State of California, 1973-1974
Executive Secretary:	Geothermal Resources Board, State of California, 1973-1975
Member:	Hospital Building and Safety Board, State of California, 1973-1975